

FLOWERING BULBS



Bulletin 120

Agricultural Extension Service
THE OHIO STATE UNIVERSITY

Flowering Bulbs

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FLOWERING bulbs offer many possibilities for use in the home garden. The many different kinds of bulbs give us a variety of bloom, a range of color, a sequence of bloom, and a gorgeous effect equalled by few other groups of flowers.

Because of their rapid growth and brilliancy of coloring, bulbs are great favorites with flower growers. Then, too, the fact that so many of them come in bloom very early in the spring, when no other kinds are able to grow and bloom outdoors, adds to their fascination.

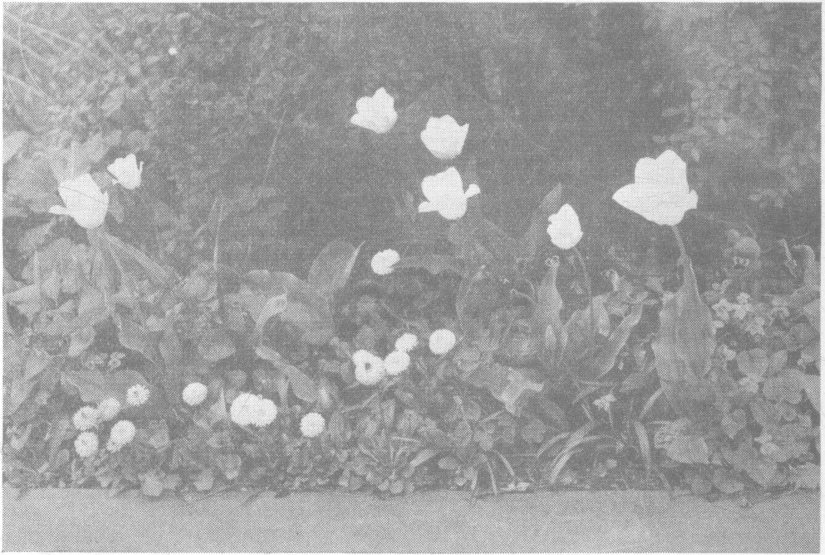


Fig. 1.—A few tulips and other early flowers planted here and there in front of the shrubs adds to the beauty of the garden.

It is possible to grow a variety of forms so as to have bulbs in bloom from March until September. Most people are familiar with the early blooming types, as the Crocus, Tulip, and Lily, but overlook entirely the possibilities of others equally interesting but less well known, as the Grape Hyacinth, the Squill, the Fritillaria, and the bulbous Iris.

Let us see what is meant by the word "bulb." Although botanically a bulb is an underground stem with fleshy scales, such as the onion, the narcissus, and the lily, yet the term has come to include those plants growing from and producing a fleshy stem or root for the storage of food, such as the corm of a crocus or the tuber of a dahlia.

Uses of Bulbs

Bulbs may be used in a variety of ways. Bulb gardens, as shown in our public parks and in some home gardens, afford opportunity for artistic effects, although the quantity of bulbs called for prohibits such a display in the average garden. With equal charm, however, bulbs may be used in the flower border, among shrubs, in rock gardens, in odd nooks and corners, in the wild garden, or naturalized in the rougher parts of the yard.

Bulbs in the Flower Border

One of the most effective uses of bulbs is in flower borders and flower beds, where they may take their place among the other flowers (whether annuals or perennials) as a unit in the continuous bloom cycle from spring to fall. They may be left in the bed after blooming and after their leaves have yellowed and been cut off, for their place will be taken by some other flower.

In planting bulbs in such a situation, they will be most effective if massed irregularly in groups of six to twenty-five. If planted in a single line around a part of the bed, there will not be enough color in any one place to make it worth while. In planting bulbs in this manner, especially the smaller ones, use but a single variety or color. In using Tulips many prefer a mixture of Darwin or Breeder Tulips rather than a single variety of one color.

Bulbs Among the Shrubs

The shrub border offers a convenient location for groups of bulbs, not only the low growing Crocus and Grape Hyacinth, but the larger and more brilliant Tulips and Narcissus will be found very effective. Here again, groups rather than lines of bulbs should be utilized. The taller growing plants such as the Tiger Lily may be used among the shrubs, or be placed behind the shrubs if they are not too tall.



Fig. 2.—The perennial flower border may be interplanted with bulbs which may be left in the ground from year to year.

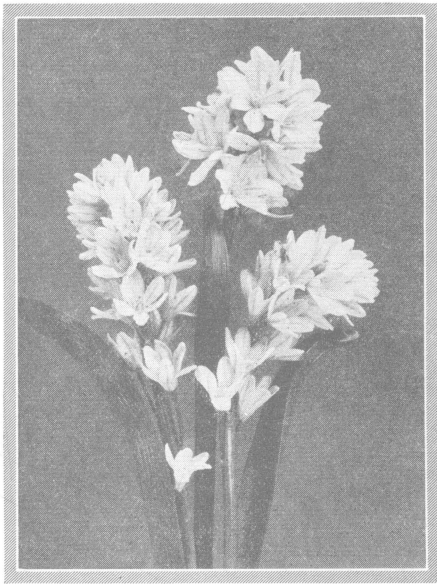


Fig. 3.—The Striped Squill (*Puschkinia*) is hardy, and will multiply rapidly.

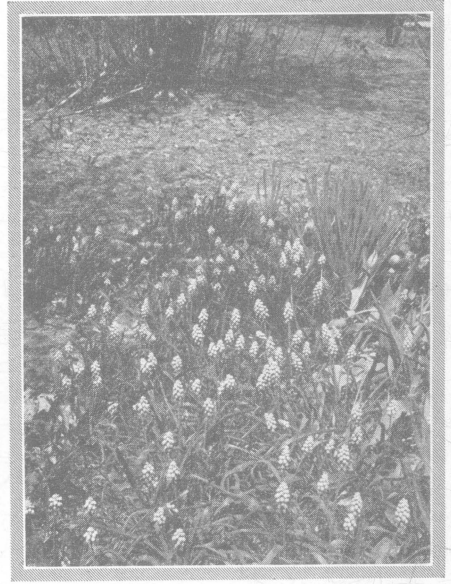


Fig. 4.—Grape Hyacinths will soon establish large clumps, and give an abundance of bloom in April.

Bulbs in the Rock Garden

The smaller types of bulbs fit in well in the average rock garden. Plant them in pockets beneath those rock plants which do not form a solid mat over the surface of the soil. They will add their spot of color and then be hidden by the later blooming rock plants above them. Bulbs that are especially adapted to this purpose are the Crocus, the Snowflake, the Snowdrop, the Glory-of-the-Snow, the Squill, the Winter Aconite, the Dogtooth Violet, the Guinea Hen Flower, the Grape Hyacinth, the Coral Lily, *Tulipa kaufmanniana*, and *Tulipa clusiana*.

Perennials to be Planted Among the Bulbs—

Alyssum	Gaillardia	Snow-in-Summer
Balloon Flower	Iceland Poppy	Stokesia
Columbine	Moss Pink	Sunrose
Coreopsis	Pyrethrum	Veronica
Forget-me-not	Rockcress	

Annuals which May Be Used Among the Bulbs—

Arctotis	Dwarf Zinnia	*Poppy
Browallia	*Dwarf Calliopsis	Sanvitalia
*California Poppy	Nemesia	*Snapdragon
Clarkia	*Petunia	Verbena
*Cornflower	Phlox drummondii	

* Will often reseed and come up every year.

*"Utilizing the Nooks and Corners"**

"Hardly ever can it be said that a garden is so full of bulbs that no more can be placed in it. Nearly always there are nooks and corners that might be utilized to bring about charming spring pictures. A careful inspection of even the smallest of gardens will usually reveal many such places that at the time are giving no good account of themselves at all. It is a great pity not to make use of these nooks in the interest of spring delight. Here are a few such positions that in most gardens are neglected.

Close About the Base of Trees—Scillas, Snowdrops, Winter Aconites, Daffodils, Crocuses.

Rough Banks—All varieties, including *Tulipa sylvestris* and *Tulipa clusiana*.

Beneath Shrubs.—Any low growing sorts

At the Base of Hedges.—All kinds, including Tulips.

Close to Garden Seats.—Daffodils in particular.

In the Lawn.—Crocuses, Snowdrops, Scillas, *Chinodoxas*, Muscari.

In the Rose Beds.—Daffodils or Tulips.

Between Clumps of Peonies.—Daffodils, Tulips, Lilies.

Between Rows of Vegetables for Cutting.—All kinds.

Tucked in About the Sundial or Bird Bath.—All kinds.

At the Base of Grape Vines.—All kinds.

At the Base of Climbing Roses.—Muscari, Narcissi, Tulips.

In the Fern Bed.—Scillas, Trilliums, Snowdrops, Fritillaries, Winter Aconites.

Close Against a Wall Behind the Perennials.—All kinds.

The Dull Border on the North Side of the House.—Scillas, Snowdrops, Winter Aconites, *Leucojums*.

At the Edges of Grass Walks.—Muscari, Crocus, Scillas, Snowdrops, *Chionodoxas*."

Naturalizing Bulbs

In many yards there are places more or less wild and natural, where the less formal types of bulbs such as Narcissus, Squills, Crocus, Grape Hyacinth, Camassia, Fritillaria and some of the native Lilies may be naturalized. These bulbs will soon make themselves at home and multiply.

It is not only a relatively inexpensive method of beautifying the rough spots in the yard, but is productive of a charming effect.

Bulbs in Shady Spots

Shady places in the yard, which are so often a problem, may easily be beautified by the use of bulbs, provided, of course, that the soil is not completely starved by a mass of tree roots. The Narcissus, Camassia, Crocus, Dogtooth Violet, and many of the Lilies are among those bulbs which will thrive in a shady spot.

* Copied by special permission from "Beauty from Bulbs," by John Scheepers.

Culture of Bulbs

When to Plant Bulbs

The majority of the hardy bulbs should be planted in the fall during October and November, but a few varieties such as the Madonna Lily and the Nankeen Lily, should be planted in August. Summer Hyacinths may be planted in the spring; Japanese Lilies may also be planted in the spring if the bulbs have been kept in cold storage over winter.

Bulbs which have a protective covering of dry scales, as the Tulip and Narcissus, do not deteriorate if not planted immediately. Unprotected bulbs such as the Lilies dry out very rapidly, and if not planted at once soon lose their vitality and may die.



Fig. 5.—The Crocus is very effective when naturalized in the lawn but not as permanent as when planted in the flower border.

Cost of Bulbs

Although the first cost of bulbs is comparatively high, yet when we stop to consider that most of them will not only live for a number of years, but will increase and multiply, we find that they are really an excellent investment. The delight which a bed of mixed Darwin Tulips gives is not to be measured in terms of dollars. A dozen Regal Lilies, their purple-edged blossoms dazzling white against a background of shrubbery, is a sight which will gladden the eye.

Why not plan to buy a few bulbs each year? In this way in the course of a few years you will have an excellent collection—Tulips one year, Crocus and Grape Hyacinths the following year.

Where to Buy Bulbs

If one is inclined to shop around, a wide range of prices will be found for many of the bulbs, especially those imported from Europe. It is usually true, however, that bulbs which are apparently low priced are the most expensive ones, due to the fact that they are culls or have been injured in some way in shipment. Either buy your bulbs from a concern which specializes in good material, or accept the fact that you are taking a chance.

Methods of Planting Bulbs

Although the majority of bulbs will grow in almost any kind of soil, all of them (with one or two exceptions) need soil that is well drained. Nothing will cause bulbs to disappear or deteriorate so quickly as poorly drained ground. Although many bulbs will grow and blossom in poor soil, most of them will give better results in good soil.

In planting bulbs there are two general methods used. One method is to place the bulbs on the surface of the bed where they are to be planted, then plant each bulb in an individual hole dug by a trowel. It is vital in placing the bulb in this hole that the base be placed on soil and not in an air pocket at the bottom. This is one reason a trowel is better than the old method of using a pick or crowbar.

The other method, used particularly in formal gardens or large beds, is to remove the top soil from the entire bed to the depth to which the bulbs are to be planted, set the bulbs in place, and shovel the soil back. This may only be used where there are no perennials, and is usually more laborious than necessary for home planting.

Each type of bulb (and in the case of Lilies, each variety) has a more or less optimum depth at which it should be planted. If the soil is extremely light and sandy, bulbs may be planted deeper than if the soil is heavy clay. In general, bulbs are planted from two to three times their own depth beneath the surface. The exact depth at which to plant each bulb will be given in the description of that type in the following pages. (See pages 10 to 24.)

Fertilizers for Bulbs

Many gardeners claim that bulbs thrive in average soil without the application of fertilizers, yet there is no reason why the soil should not be enriched in this way. One of the following methods of applying fertilizer is suggested:

1. A mulch of well rotted stable manure may be applied in late autumn, and then left on through the winter. Rotted stable manure may also be incorporated with the soil when preparing the bulb bed, but it should not come in contact with the bulbs.
2. A light application of a complete chemical fertilizer, such as a 4-12-4, may be given the plants during April or May. Apply at the rate of two or three pounds per hundred square feet.

*"A Few General Observations to Be Kept in Mind"**

"That the grass in which bulbs are planted must on no account be cut until the foliage has turned yellow.

That no bulb should be lifted before the foliage has completely ripened, but it may then be taken up and replanted at once if desired.

That the ground should be dry when bulbs are set out; a wet bed before they have begun to grow is injurious to them.

That a good rule for planting bulbs is three times their own depth.

That, generally speaking, bulbs should be planted more deeply in light sandy soil than in those of a heavy and clayey nature.

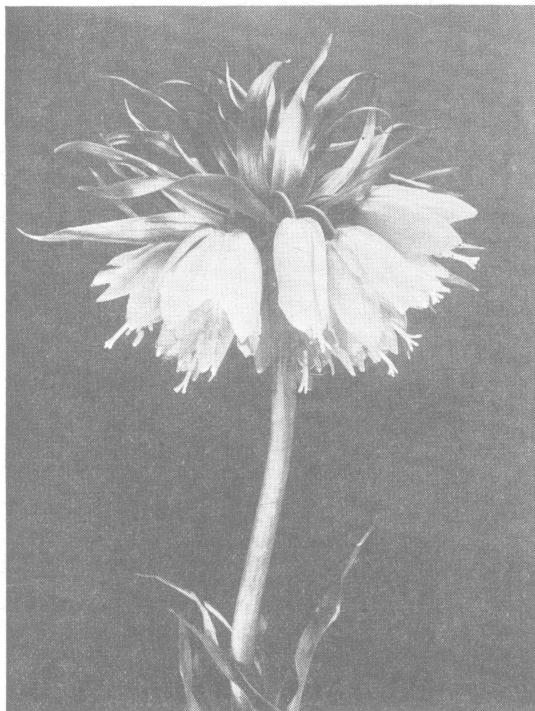


Fig. 6.—The Fritillaria has a unique flower cluster. Rising above other early spring flowers, they seldom fail to attract attention.

That Daffodils, Wood Hyacinths, Heavenly Blue Grape Hyacinths, and Leucojums, because of the untidy effect of their strong foliage when ripening, are not suitable for planting in the middle of the lawns. Crocuses, *Scilla sibirica*, and Snowdrops are better for this purpose.

That all species of *Chionodoxas*, *Eranthis*, and *Galanthus* will thrive in the shade of beech and evergreen trees, which is true of few bulbous plants.

That naturalizing bulbs in woods and fields, orchards and meadows enables us to increase our spring delight a thousand fold.

That these bulbs are an investment that increases year by year in value as certainly as the seasons turn."

Diseases and Pests

Bulb Diseases

The majority of bulbous plants are surprisingly free from serious diseases. The few diseases that are ordinarily encountered may be prevented to a large degree by careful inspection of bulbs before planting. Discard and burn all bulbs or tubers that have any appearance of disease. This may be indicated

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by dark spots, softness, or decay. Some pathologists even recommend removing the outer scales and closely inspecting the bulbs just before planting.

Any bulb diseases that are present in the garden may be controlled by digging and burning the diseased plants. Take up the entire plant, including the bulb and the soil surrounding it, and place in a bonfire. This prevents the disease spreading to other plants.

The worst disease likely to be encountered is the botrytis blight of Tulips, sometimes called the fire disease. It is serious in some sections. Small yellow spots surrounded by darker areas on the leaves are the most likely indication. These areas spread in wet weather to the entire leaf surface. Flowers may also be spotted until the entire flower shrivels and turns brown. The only control is the removal and burning of entire plant, including the bulbs and the surrounding soil.

Other diseases sometimes found on various bulbs are soft rot of bulbs, and gray bulb rot. The only control again is destruction of the plants.

The rust on Lilies may occasionally cause annoyance. Manifested by small brown areas on the leaves and stems, it may be controlled in its early stages by dusting with sulfur or copper lime dust, or spraying with Bordeaux mixture. The Madonna Lily is especially susceptible to the rust.

Bulb Pests

The pests of bulbous plants are relatively few in number. If healthy bulbs free from insect pests are planted, the following will probably be the only serious pests encountered.

Moles.—Moles cause some destruction, with much more annoyance, by burrowing among the bulbs. Being carnivorous, it is doubtful if they eat the bulb. They may be trapped or gassed with Cyanogas.

Mice.—Mice often use the mole runs and eat the bulbs. Place wheat, soaked in a solution of 1 ounce of strychnine dissolved in 1 gallon of water, in the runs.

Chipmunks.—These little animals are a serious pest in some localities. They dig and eat or carry off many of the smaller bulbs. Chipmunks are easily caught in large wire rat traps, after which they may be drowned.

Aphis or Plant Lice.—Aphis may be easily controlled by spraying with Black Leaf 40 or a pyrethrum extract. It will take several sprayings at intervals of 5 to 7 days to control this pest.

Red Spider.—This minute mite will become troublesome only on summer flowering bulbs. Dust with sulfur in June and August for control.

Grubs.—They may prove troublesome in ground that was in sod the previous year. Fall spading is the only practical control.

Bulb Mites and Narcissus Bulb Fly.—These pests will not be found on stock purchased from reliable dealers. Destruction of the bulbs is the only practical home remedy.

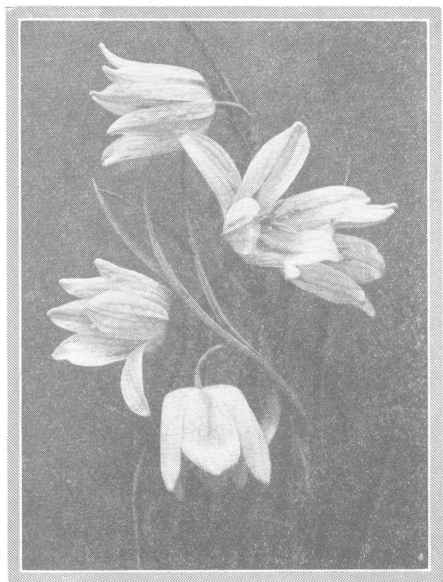


Fig. 7.—The Guinea Hen Flower (*Fritillaria meleagris*) may be used in the rock garden or flower border.

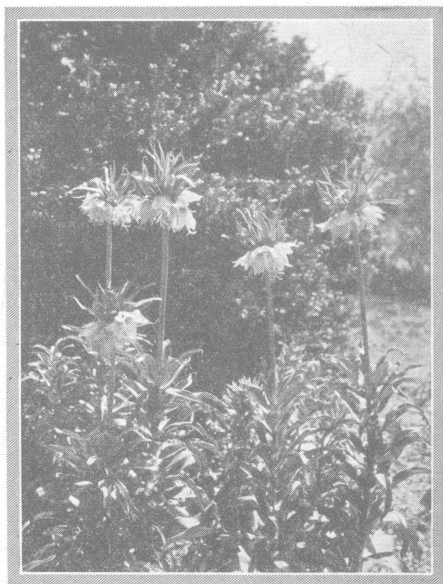


Fig. 8.—The Crown Imperials (*Fritillaria imperialis*) once planted, will remain for many years.

Types of Bulbs

Bulbs may be divided, roughly, into three groups: (1) the Hardy Bulbs, which may be planted and left outdoors throughout the year, unprotected; (2) Half-Hardy Bulbs, which can be depended upon to live over winter only if given protection; (3) Tender Bulbs, which must be carried over winter indoors and planted anew each spring.

This bulletin is devoted largely to those bulbs which may be left out of doors, although brief discussions are given of the half-hardy and tender forms.

Hardy Bulbs

Camassia esculenta

This is a native Ohio plant with edible roots. Its pale blue flowers grow on stems 12 to 24 inches high. *C. leichtlini*, another variety, grows 3 feet high. Although not brilliant or conspicuous plants they work in to advantage in the perennial border, the rock garden, or naturalized, and have the added advantage of growing equally well in the shade or in the sun.

Plant in the fall, 3 to 4 inches deep, 6 inches apart.

Chionodoxa luciliae — GLORY-OF-THE-SNOW

An early blooming alpine plant from Crete and Asia Minor. It is a small, low growing plant 3 to 8 inches. Flowers are usually white but sometimes in range of colors from lilac to red. It is best planted in masses where it may be seen from the windows, since it blooms during late March and early April. It will usually multiply under favorable conditions. Plant in the fall, 3 inches deep, 2 to 3 inches apart.

Colchicum — AUTUMN CROCUS

A native of Europe, resembling the Crocus. The leaves appear in the spring; the flowers in the fall are white, lavender, or striped combinations of these colors. The Autumn Crocus grows about 6 inches high. It is sometimes sold as the Sensation Bulb that will bloom without soil or water. Early fall plant 2 inches deep.

Crocus — CROCUS

A native of the Mediterranean region and southwest Asia, it is one of our earliest and also one of our cheapest "bulbs." Although there are many species, only a few are commonly grown.

C. vernus has supplied us with many named varieties in purple, blue, and striped colors. The yellow forms are probably from *C. moesiacus*. Some of the less known forms of Crocus, although less showy, bloom earlier. *C. sativus*, the Saffron Crocus, is autumn blooming.

The Crocus, if planted in the lawn, soon disappears because of the cutting of the foliage. It is commonly naturalized; if planted in the flower border or among the shrubs it will give a gorgeous mass of color and will multiply rapidly. Plant the corms 3 inches below the surface, 3 or 4 inches apart, from September to November. Fall blooming varieties are planted in July or August.

Eranthis hyemalis — WINTER-ACONITE

A native of Europe, the Winter-Aconite is different from most of our early blooming bulbs in that it belongs, not to the Lily or Amaryllis group, but to the Buttercup family. Although not especially showy, the dainty yellow flowers make a strong appeal because of their appearance in late March or early April, before other bulbs are in bloom. It grows 2 to 3 inches high. Plant in the fall 2 to 3 inches deep in a location that is not too dry. It will stand considerable shade.

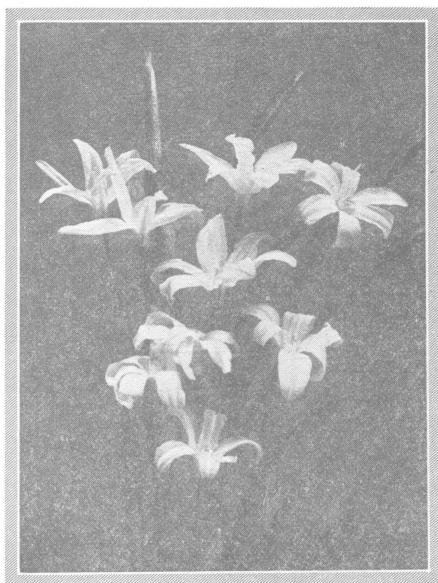


Fig. 9.—The *Chionodoxa* (Glory of the Snow) may be naturalized in the wild garden or used for early bloom among the rocks.

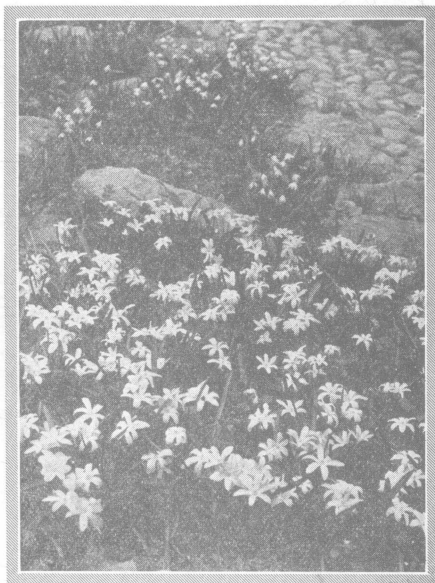


Fig. 10.—Glory of the Snow massed in a rock garden is a beautiful sight during March and early April.

Fritillaria — FRITILLARY

F. imperialis, the Crown Imperial, a striking Persian plant, is still found growing wild in some old gardens where its extreme hardiness has enabled it to exist for many years. The flowers are in clusters at the top of a 2- to 3-foot stem, shaded by a deep whorl of leaves; the colors are dull red, yellow red, yellow, or orange. Unfortunately, they have a strong odor which is objectionable to some. This variety will grow in sun or in partial shade, but prefers a rich mellow soil. It is fall planted 4 to 5 inches below the surface.

F. meleagris, the Guinea-Hen Flower or Checkered Lily, is a more dainty, more graceful plant than the *F. imperialis*. The flowers are striped or checkered

in an interesting way, yellow, purplish, or maroon on a light background. It grows about 12 inches high, and is especially adapted to use in the rock garden. Fall plant 3 to 4 inches deep and leave undisturbed.



Fig. 11.—The dainty white flowers of the Snowdrop seem fragile, but are the first to appear in early spring.

Galanthus nivalis — SNOWDROP

A native of Crete and Southern Europe which closely resembles the Snowflake; however, it has a solid stem, whereas the Snowflake has a hollow stem.

Snowdrops are extremely early white flowering bulbs, 3 to 4 inches high. They should be fall planted, 3 inches deep and 3 inches apart, preferably in clusters. They will thrive both in sun and shade. There is also *G. elwesii*, the Giant Snowdrop, from Asia Minor.

Galtonia candicans — SUMMER-HYACINTH

A summer flowering bulb from South Africa with slender stalks of white flowers 2 to 4 feet high, which is quite effective in the perennial border. Plant in the fall or spring 6 inches apart and 3 to 4 inches deep in groups of six to twelve.

Hyacinthus orientalis — HYACINTH

A native of Greece and Asia Minor. Although most commonly used as a potted plant for Easter, there is no reason why it should not be planted in the garden. The large bulbs produce heavy spikes of flowers; they are known as Dutch Hyacinths. These come in single and double flower forms, and in colors red, pink, blue, purple, and so-called yellow, which is merely a dark cream color.

Hyacinths should be planted in a sunny location about 6 inches apart and 3 to 4 inches deep. It will usually be found that the flowers become smaller and more

dwarfed each year, and many people prefer them after they have been planted in the garden for several years. Although Hyacinths usually are grown in formal beds, there is no reason why they should not be used informally like Tulips and Narcissus.

In buying Hyacinths it is not necessary to buy the largest sized bulbs; use those from 2 to 2¼ inches in diameter, as they will be cheaper and will be just as satisfactory for home use. Even the so-called miniature bulbs, 1½ inches in diameter, will be satisfactory, although of course the flowers will be smaller.

Leucojum — SNOWFLAKE (see *Galanthus*)

Native of Europe and the Mediterranean region. *L. vernum*, the Spring Snowflake, is 12 to 15 inches high, blooming during March and early April; it is followed by *L. aestivum*, 8 to 12 inches high, blooming in May. Both of these are white, tipped with green. There is also a fall blooming variety.

Plant the corms in the fall 2 to 3 inches apart and 3 to 4 inches deep.

Lily — LILY

The Lily has been cultivated for many years, having been used extensively by the ancient Greeks and Romans. All true lilies grow from a bulb and belong to the genus *Lilium*. There are many other flowers called Lilies such as the Daylily and the Painted Lily, which are merely lily-like in their appearance.

Most Lilies demand a well drained soil; it should also be deep enough for proper rooting (see "Where to Plant Lilies"). Most native lilies grow in the sun, often among low growing shrubs or perennial plants which protect their roots from the heat of the sun. To get the best results with Lilies we should grow them under similar conditions or supply this protection with a mulch of leaves or peat.

Propagation of Lilies.—Lilies are propagated by scales, bulbils, bulblets, and seed.

Scales.—Most Lilies may be propagated by scales. Dig the mature bulbs in early fall, and remove one-third to one-half of the outer scales, then replace the bulb immediately. The scales should be planted in a thoroughly drained and prepared bed. Dig a furrow 2 inches deep, put ½ inch of sand in the furrow and place the scales on this sand. Cover the scales with sand, peat moss, or light soil. The plants are left in this bed for one or two years, depending on their growth and whether or not they are crowded. The bed should be well mulched each winter with straw or peat moss. Bulbs from these scales will bloom the second or third year, depending on the variety.

Bulbils.—The bulbils which are produced in the axils of the leaves of some varieties are a common means of propagation. However, *L. tigrinum* is the only common Lily producing them. Remove the bulbils shortly after blossom time and plant 2 inches deep in a bed. Mulch the bed during the winter, and allow the plants to remain there two years. They will bloom in from two to three years.

Bulblets.—Many lilies propagate naturally by the division of the old bulbs. This may be hastened by digging and separating the clumps every year or two.

Where to Plant Lilies.—Lilies may be used in the perennial border with other large flowered plants, never solely to add accent. They may be used among the shrubs, the low growing types more to the front and the taller ones such as the Tiger Lily to the back. In the larger rock garden the lower types such as the Coral Lily and *Lilium elegans* are quite effective. Among the evergreens or the Rhododendrons they do their bit to relieve the somberness of the foliage. Many

of them may be naturalized. One of the few places where Lilies will *not* thrive is near surface roots of trees such as elms and maples.

Deep planting is usually advisable for Lilies, but unless the soil beneath the bulbs is rich and mellow nothing will be gained. If the soil is poor and shallow it will pay to dig a hole 18 inches to 2 feet in depth and fill in with good soil. The depth of planting will be determined by the type of Lily. Some varieties root entirely from the bottom of the bulb; these should be planted relatively shallow, about 4 to 6 inches below the surface. Other Lilies are stem rooting; these bulbs should be planted from 8 to 10 inches below the surface, allowing the roots to develop above the bulb.

Place each bulb on a bed of sand an inch in depth, then cover the bulbs with an inch or so of sand or peat to obtain good drainage around the bulbs. The practice of planting Lily bulbs on their sides is of doubtful value.

Lily bulbs, not being covered by protective scales like the Narcissus and the Tulip, dry out very rapidly. They should be planted as soon as possible after digging. In case they have to be held before planting, they should be buried in sand, peat, or dry earth.

Selection of Varieties.—The varieties discussed in this bulletin are but a few of the many which may be obtained from the different species. It will be noticed in reading over the discussion that some are exacting in their requirements and may at times be difficult to grow, whereas others are sure to give results under proper conditions. The beginner should choose the more certain types at first and each year add one or two new varieties.

The Lilies, being rather tall, with heavy flowers at the top of the stem, usually require some sort of wind protection. If planted off by themselves they are likely to be blown over, unless staked. Incidentally, wind protection in the form of shrubs or other tall growing perennials also sets off the Lilies to advantage.

Lilium auratum — Japanese Lily. Height, 4 feet; blooms in July.—This is a beautiful plant, if it can be grown, but it is rather erratic in habit. Plant bulbs 8 to 12 inches deep in full sun in a soil that is not very rich. The bulbs do not last over two or three years, but the gold barred white flowers are sufficiently attractive to make the growing of this variety worth trying. Plant in fall or early spring.

Lilium canadense—Canada Lily. Height, 3 to 4 feet; blooms in July.—A native of Ohio, growing in sun or partial shade. The yellow or red flowers are spotted with brown. The petals flare out and the flower itself nods. An easily grown Lily, planted in the fall or early spring.

Lilium candidum — Madonna Lily. Height, 3 to 4 feet; blooms in July.—A glorious trumpet Lily, white and fragrant, which thrives in most gardens, but is difficult to grow in others. It differs from most Lilies in being dormant in August; at this time it should be dug and planted, thus allowing leaves to develop before winter. Plant 2 or 3 inches below the surface and leave it alone as long as it is doing well.

Botrytis disease may be controlled by spraying with Bordeaux mixture.

Lilium elegans.—Height, 2 to 3 feet, blooms in June and July.—A low growing Japanese Lily with upright flowers. There are many varieties, ranging from yellow to red in color. They are vigorous growers which multiply very rapidly and may be divided every few years. The bulbs are stem rooting, and should be planted 6 inches deep in fall or early spring. The plants thrive best in the sun.

Lilium hansonii — Hanson Lily. A Korean plant, one of the first of the Lilies to come up in the spring. The new shoots, unless protected, are likely to freeze back. With 4 to 12 nodding flowers, orange or yellow in color, it grows to a

height of 4 to 6 feet, and blooms in June and July. Plant 10 inches deep in fall or early spring, in sun or partial shade. This is a Lily well worth growing.

Lilium henryi — Henry Lily. A vigorous growing Lily from China, preferring heavy, rich soil and partial shade. It grows to a height of 5 to 6 feet, and blooms in August. The flowers are nodding, orange with dark spots, the foliage excellent. Plant 10 to 12 inches deep.

Propagate by removing stem bulblets yearly without disturbing the main bulb.

Lilium martagon — Martagon Lily. A rather unusual Lily from Europe with rosy purple flowers. Being base rooting, it should be planted 4 inches deep in fall or early spring. It grows to a height of 4 to 5 feet, and produces huge heads with many flowers. Blooms in June.

Lilium regale — Royal Lily. This Lily from Western China is probably the most widely grown Lily, being easily produced from seed, and growing under almost any conditions. It attains a height of from 3 to 6 feet, and blooms in June and July. The flowers are white and fragrant, with a rosy purple edging on the petals. This variety is commonly called the Regal Lily.

Plant the bulbs 9 to 12 inches deep, preferably in rich soil. Being one of the first Lilies to come up in the spring, the plants sometimes freeze back. It takes four years to mature the bulbs from seed, although they often bloom the second and always the third year.

Lilium speciosum — Speciosum Lily. Another Lily from Japan, which grows to a height of 3 to 4 feet. One of our most popular bulbs because of its spectacular white flowers bearded inside with carmine pink, but it is not always satisfactory, and lasts but a few years at the most. Plant 10 to 12 inches deep in a rich soil. Blooms in September.

These bulbs arrive late in the fall from Japan and are worthless if held until spring. Therefore the bed in which they are planted should be heavily mulched to prevent freezing of the soil and allow planting during late November or even in December.

Lilium superbum — American Turkscap Lily. This variety grows to a height of 4 to 6 feet. It is a native of Ohio from the lowlands and the woods, but will grow in ordinary garden soil. It is base rooting and has orange red flowers with dark spots and reflexed petals. Blooms in August. This variety of Lily does best in a peaty soil.



Fig. 12.—The Hanson Lily is both hardy and permanent. The tall spikes of orange flowers add an interesting accent to the border.

Lilium tenuifolium — Coral Lily. A dainty Siberian Lily for the rock garden, 1 to 2 feet tall. The dainty coral red flowers with reflexed petals are most effective, but under the best conditions it lasts only a few years. It is easily grown from seed and will bloom the second year. Blooms in June.

Lilium testaceum — Nankeen Lily. Height 4 to 5 feet; blooms in June and July. One of the choicest of all Lillies. The nodding flowers with reflexed petals daintily creased and apricot or nankeen yellow in color are fragrant like the parent variety, *L. candidum*. It should be planted in late August or early September, 4 to 6 inches deep.

L. tigrinum — Tiger Lily. Height 4 to 6 feet; blooms in August. This Lily from Japan and Korea has escaped and become native in some parts of the United States. Its tall spikes of brilliant orange red flowers spotted with purple black make it most attractive. This variety does well if planted in rich soil. Plant 8 to 10 inches deep in fall or early spring. It is easily propagated from the bulbils in the axils of the leaves.

There is a double variety, being the only double Lily.

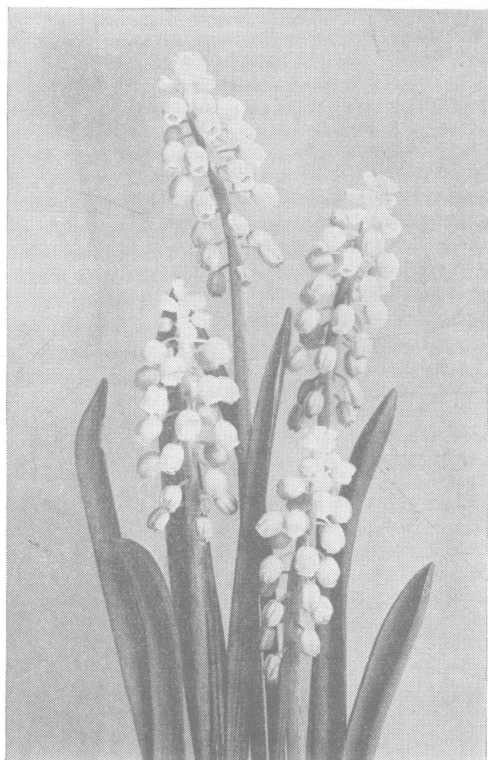


Fig. 13.—Grape Hyacinths may be used for cut flowers as well as garden effects. Both the blue and the white varieties are worthy of a place in any garden.

Lycoris squamigera
(*Amaryllis halli*) —

CLUSTER AMARYLLIS

An interesting plant from Japan. After the foliage dies down in early summer, it is followed in August by a bare spike 2 feet high carrying a cluster of large fragrant pink or rose lilac flowers.

This hardy variety of *Amaryllis* may be planted in the perennial border 2 to 3 inches deep and 6 to 8 inches apart, in groups of three or more. It will multiply and after several years may be divided.

Muscari botryoides —

GRAPE-HYACINTH

A South European plant that is useful in the garden and easily naturalized. The precise little spikes of blue or white bell-shaped flowers bloom just after the Crocus. Fall plant 2 to 3 inches deep, 2 to 3 inches apart, in clumps of twenty-five or more. The plant will multiply rapidly and may be divided every few

years. They will grow in sun or shade. There are a number of varieties—blue, white, flesh color, and heavenly blue. There is also a feathered variety.

The Grape-Hyacinth may be used in rock gardens, among the evergreens, in front of the shrubs, in the perennial border, or in the odd corners of the yard. Be sure to plant some.

Narcissus — DAFFODIL

A glorious group of plants especially well adapted to American gardens. Their grace and color, and the ease with which they can be propagated, should assure them a place in every garden. The attraction that the Narcissi hold is well expressed in Wordsworth's exquisite poem, "Daffodils." Their popularity is not confined to this country alone, for in Europe, especially in England, we find a vast amount of hybridizing has been done from the ten wild species native to Europe and the Mediterranean region. Many types and thousands of varieties have been produced. The resulting confusion of names has been cleared up in the classification of the Royal Horticultural Society of England.

Before taking up the classification let us see what some of the names mean. *Narcissus* is the scientific name, and it includes Daffodils, Jonquils, Paper White Narcissus, the Chinese Sacred Lily, and many other forms. All of these are Narcissi, but the reverse is not true—all of the Narcissi are not Jonquils. The name Daffodil, although originally applied to those Narcissi having long trumpets, is now used synonymously with *Narcissus*.

Classification of Narcissus:

1. Trumpet variety. The trumpet or crown is as long or longer than the segments of the perianth or saucer. In this group we find several subdivisions: (1) the entire flower is yellow, as in the variety King Alfred; (2) the entire flower is white or the flower is in two colors, as in the variety Empress. This is the group that was formerly known as Daffodils.
2. *Incomparabilis Narcissus* or Half Cup Group. The cup is not less than one-third or more than equal to the perianth segments. Examples of this are *Gloria Mundi* and *Lucifer*.
3. *Barrii Narcissus*. The cup less than one-third the length of the perianth segment. Examples are *Conspicuous* and *Sea Gull*.
4. *Leedsii Narcissus*. Usually having short trumpets with a white perianth. Varieties are *White Queen* and *Ariadne*.
5. Jonquil Hybrids. These are distinguished by having grass-like foliage with two or more flowers on the stem. Sometimes fragrant.
6. Tazetta Hybrid or Polyanthus *Narcissus*. Many flowers to the stem. Includes the Paper White *Narcissus* and the Chinese Sacred Lily. One of the common varieties is *Alsace*.
7. Poet's *Narcissus*. Cups very flat, usually with dark red edge.

There are four other groups listed in the classification which are of relatively little value to the amateur gardener.

What Varieties to Plant.—After looking over the classification and the long list of varieties in the catalogues, one may well feel confused. An easy solution is to get a few bulbs of one variety of each of the different types. You will like some types more than others and may later add to the varieties of that type.

The variation in price is accounted for by the fact that newly introduced varieties are more expensive, as a rule. Some varieties propagate more readily than others, and thus are less expensive. Usually the newer varieties are larger flowered. For instance, if you envy your neighbor's Golden Spur, you may buy the Emperor

variety, which is bigger; but if your friend has them, you can get King Alfred, and as a final achievement, the largest of all Narcissi, Van Waverens Giant.

Uses—The Narcissus is a friend of many and varied uses. It may be used in groups in the flower border, in front of the shrubs, beneath trees, in clumps in the wild garden, alongside a stream if you are fortunate enough to have one, beside the little pool, along the fences, drives, and walks.

The Narcissus may be used alone or combined with Grape Hyacinth, Squills, or with some other perennial as Forget-me-not, Shooting Star, or Phlox divaricata. By a careful selection of varieties it is possible to have Daffodils in bloom for at least six weeks.

When naturalized in the sod the grass should not be cut until the Daffodil foliage becomes yellow. All Narcissi, unless in the cutting garden, are more effective when informally planted than when in rows.

Plant the bulbs about twice their depth beneath the surface and from 4 to 6 inches apart. If they are left undisturbed for a number of years they form solid masses. When this stage is reached they may be dug and divided. The newly dug bulbs should not be exposed to the sun for any length of time, as such exposure may result in sun scald. It is advisable to replant them immediately.

Narcissus bulbs should be planted as early in September or October as possible. Bulbs planted in November or December should be heavily mulched to allow fall rooting.

Fertilizers for Narcissus.—Do not allow fresh manure to come in contact with the bulbs. Rotted manure or a complete chemical fertilizer such as a 4-12-4 may be applied with safety during April and May. The latter may be applied at the rate of 3 pounds per hundred square feet.

Ornithogalum umbellatum — STAR-OF-BETHLEHEM

This plant is a native of the Mediterranean region. It grows 6 to 8 inches high; the flowers are white. It has escaped and become a pest not only in yards but also on the farm, where it is difficult to eradicate. Be careful about planting it.

There are, however, other varieties which are taller and more showy and not weeds, *O. nutans*, *O. pyramidalis* and *O. arabicum*.

Puschkinia scilloides — STRIPED SQUILL

A little plant from Western Asia closely resembling the *Scilla*. Grows 4 to 6 inches high and has bluish white striped flowers. Should be treated the same as you would Squills.

Scilla — SQUILLS

A large group of spring flowering plants from the old world. Plant in the fall 3 to 4 inches apart. Squills may be used in the rock garden, in the flower border, among the shrubs, or among the evergreens, in sun or shade. They should be planted in fairly good soil, and allowed to remain undisturbed. They propagate fairly rapidly.

S. bifolia is the earliest Squill. It grows 3 to 6 inches high, has blue flowers, and blooms in March and early April.

S. siberica, 3 to 6 inches high, with blue and white flowers, blooms during March and early April.

S. nutans, the English Bluebell, is 8 to 12 inches high, has blue, white, lilac, and pink flowers, blooming in April and early May. It does best in a soil rich in humus.

S. campanulata, the Spanish Bluebell, reaches a height of 12 to 15 inches, and is the most showy of all the Squills. It blooms in May, and has blue, white, rose, and rosy purple flowers. It needs a soil rich in humus.

Tulipa — TULIP

The Tulip has been grown in gardens for many centuries, although it was not developed to the extent that we have it today until it was brought to Holland, where for a few years it took the fancy of the people. Enormous prices were paid for Tulips. Fortunes were made and lost, but today the Tulip is grown in almost every garden. The price has become so low that anyone can afford to buy enough of them to make an effect.

Tulips reach their best development if fall planted in deep, fertile, well drained soil. Place the bulbs 4 to 6 inches deep, and from 4 to 8 inches apart, depending on the size and variety. A late autumn mulch of rotted manure may be used. The tulip bed may need resetting every 3 or 4 years. Dig up the bulbs after the leaves have ripened, and replace only the best ones.

There are several different types of Tulips, several of which are listed below. There are other forms equally interesting, which may be found listed in the catalogs of bulb specialists.

1. Early Tulips. These come in single and double forms. The colors run from white, yellow, pink, orange, red, to lavender. Although the double forms are more often early blooming, they are not as graceful as the single types. Being lower growing than the other groups, Early Tulips should naturally be planted in front. Their average height is from 10 to 18 inches. A few of these should be in every garden, blooming as they do two or three weeks earlier than the later types.

2. Darwin Tulips. These tulips are known and beloved by all. Characterized by large, broad flowers, usually of a solid color, they vary in height in normal seasons

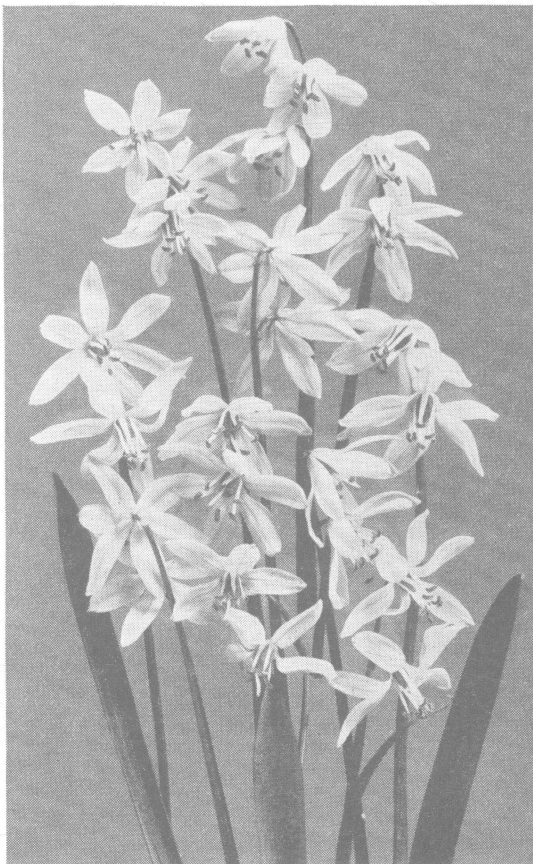


Fig. 14.—The Siberian Squill is one of our earliest spring flowers.

from 24 to 36 inches. The colors are pink, red, lavender, rose, salmon, purple, a blackish maroon, and white. They bloom at the same time as the Cottage and Breeder Tulips. As to the selection of varieties, there are so many of varying prices, that it is largely a matter of individual taste and the individual pocketbook, although many times the cheaper ones are just as fine as the expensive ones.

3. Breeder Tulips. These may be said to be the aristocrats of the family. Resembling the Darwin Tulips in height, vigor, and shape of bloom, they are distinguished by the artistic blending of several colors in one flower which produces marvelous effects. The predominating colors are apricot, orange, bronze, lilac, wine color, rose, yellow, in many cases suffused with bronze or buff. This is a mid-season type.



Fig. 15.—Tulips planted in good soil will multiply. Every 3 to 5 years they should be lifted and the clumps separated and replanted.

4. Cottage Tulips. These furnish a grace of bloom different from the others because of their long, pointed petals and thin, wiry stems. The colors are usually simple, although they are a hybrid form, for the Cottage, the Darwin and the Breeder Tulips are intermediate in form.

5. Bizarre and Bijbloemen Tulips. This type shows intermediate forms produced in the breeding of Tulips. They are striped and marked. Although much favored by some gardeners, others do not care for them at all.

6. Parrot Tulips. Despite the rather weak, straggly stem, the Parrot Tulip is interesting because of its intense yellow and red flowers, and the irregular shape of its petals. A few of them is sufficient in any garden.

7. Triumph Tulips. This type is a new race of hybrids produced by crossing the Darwin Tulip with the Early Tulip. They bloom slightly earlier than the

Darwins. The large flowers, produced on every stem, give us colors not found among the Darwins. The price of this group is prohibitive for extensive use in our gardens.

8. Mendel Tulips. This is another new type developed from crossing the single early Duc Van Tholl with the Darwin. Blooming a week or two before the Darwins, they show many fine pastel shades. This group, and the Triumph Tulip have been mentioned as a matter of interest, since they will, as soon as the supply increases and the price lowers, become of importance in our gardens.

9. Wild Tulips. Another group of tulips which is coming into popularity, and rightfully so, are the wild species of tulips. The two most commonly grown are *Tulipa kaufmanniana*, with dainty red flowers, yellow on the inside, and *Tulipa clusiana*, white with red stripes. Being but 6 to 8 inches in height with small flowers they are well adapted to the rock garden.

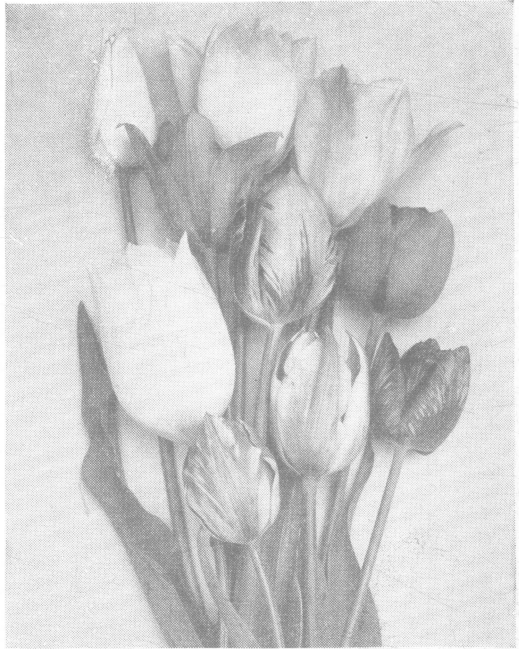


Fig. 16.—By using the various types of Tulips, we may have bloom in our garden for six weeks or even longer.

Half-Hardy Bulbs

The half-hardy bulbs usually come from mild temperate regions and will often live over winter satisfactorily if well protected with a mulch of leaves or other suitable material. If local conditions prevent their successful culture in this manner, they may be set out very early in the spring and dug in the late fall.

Despite this apparent handicap these bulbs may well be included in your collection of garden flowers.

Anemone coronaria — POPPY ANEMONE

Gay, cheerful flowers native of the Mediterranean region, they will live over winter if well mulched in a well drained soil, as in the rock garden. If unable to winter them successfully when planted in October, try planting them in March. Plant 3 inches deep and 8 to 10 inches apart. Partial shade and adequate water during the blooming season may often prove beneficial. St. Brigid and Poppy-flowered are the hardiest types. Resembling these and possibly a little harder are the *Ranunculus*, which are treated in the same manner.

Brodiaea — SPRING STAR-FLOWER

These plants are, generally speaking, natives of California. They produce slender stems 6 to 24 inches high with tubular flowers. Colors are blue, red, yellow, and white. Plant in September 2 to 3 inches deep, and 4 to 6 inches apart, in well drained soil, either beneath trees or in rock gardens.

Some of our specialists in native western bulbs carry a number of forms.

Calochortus — MARIPOSA

Charming California and western United States flowers all too seldom seen in our eastern gardens.

The several distinct types are known as Globe Tulips, Star Tulips, and Mariposa Tulips. These gay flowers come in white, yellow, pink, red, lilac, and purple. They are of varying height, ranging from 1 to 2 feet.

Plant in porous, well drained soil in October or November, and mulch well with leaves, straw, or peat moss in early December. Some gardeners recommend digging and storing during the summer if in a bed that is heavily watered. Plant in groups of six to twelve, 2 to 3 inches deep and 2 to 3 inches apart.

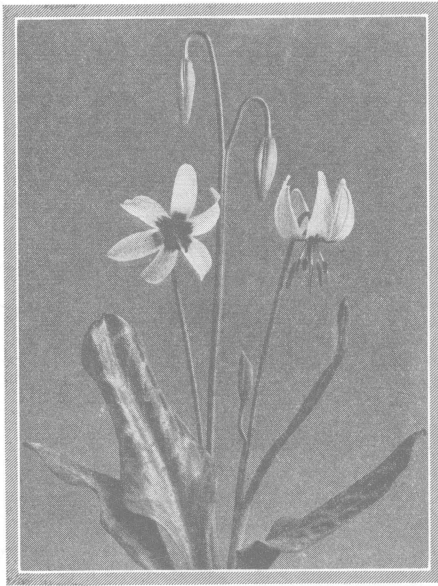


Fig. 17.—The *Erythronium* (Troutlily) although tender, is well worthy of trial in our Ohio gardens.

Erythronium — TROUTLILY (Dog-tooth Violet)

These natives of our western coast overshadow our native forms in color and beauty. The many varieties, varying in color from white, yellow, pink, to rose, may be successfully grown in Ohio. Plant in fall in shaded or partially shaded positions.

As the bulbs quickly deteriorate if allowed to dry they should be planted immediately. Plant in colonies of a dozen or more, 2 to 3 inches below the surface and 2 to 3 inches apart. Mulch well with peat moss or leaf mold throughout the year. They may be grown in the rock garden or used for naturalizing.

Iris

There are several forms of *Iris* with bulbous roots. Although they are half-hardy, they often succeed in a well drained spot if well mulched. Plant in September, 8 to 10 inches apart and 2 inches deep.

Dutch *Iris* are the most tender of this group and consequently least desirable. Spanish *Iris*, native of Spain, are white, yellow, blue, or bronze, blooming in early June. English *Iris*, natives of the Pyrenees, are white, blue, purple, and lavender, blooming in June. These are probably the most satisfactory for outdoor planting.

Ixia

Tender South African bulbs, with brilliant red, copper, blue, or yellow flowers. Although best grown as pot plants, they may occasionally be grown out of doors in

southern Ohio if heavily mulched. Plant 3 inches deep and 3 to 4 inches apart in a protected, well drained position.

Ranunculus — TURBAN AND PERSIAN BUTTERCUP

These brilliant flowers closely resemble the bulbous Anemones, and are treated in the same manner.

Tritonia — MONTBRETIA

Showy South African plants for summer bloom. They may be successfully wintered over if planted in light, well drained soil in a protected place, but even then they should be heavily mulched over winter. They do best when winter stored, in colder sections of the state, and planted early in the spring. The flower spikes, 2 to 4 feet high, resemble gladiolus with orange, yellow, and red flowers in many varieties. Plant 4 to 5 inches deep and 6 inches apart.

Tender Bulbs

A number of highly desirable flowering bulbs come from tropical or semi-tropical regions and are therefore unable to stand the low temperatures of our winters. These tender bulbs must be dug before freezing weather and stored indoors away from all danger of freezing.

There are a number of tender bulbs in addition to those discussed below, many of which are well worth growing. The culture of Gladiolus and Dahlias is discussed in full in the Ohio State University Agricultural Extension Bulletin No. 100, "Gladiolus and Dahlias."

Begonia (tuberhybrida) — TUBER BEGONIAS

Brilliant flowered plants preferring partial shade in Ohio. Start bulbs in pots in early April, and set out after last frost in May or early June. Grow in rich soil—at least one-third peat or humus. Dig after early frost and store in dry peat or sawdust at 45° to 60° F. over winter.

Calocasia antiquorum (Caladium) — ELEPHANT'S EAR

An East Indian plant producing large coarse foliage giving a distinctly tropical effect. Three to 6 feet in height, it is sometimes used near pools or for larger beds and paths, but is difficult to use successfully in the average garden. Plant in late May 2 to 3 inches deep. Dig after early frost and store in cool cellar.

Canna indica — CANNA

Vigorous, luxurious plants giving a semi-tropical effect which makes them difficult to combine with our other plants. Of easy culture and quick growth, the clumps of roots from the previous year should be divided into small sections and planted outside in early May. If desired, they may be started indoors in April in 4-inch pots and set out after all danger of frost is past. Plant the roots 2 inches below the surface and 12 to 24 inches apart. If given rich soil, they will produce large clumps by midsummer. Lift clumps in fall after early frosts and store with soil on the roots in cool cellar at 45° to 60° F.

They give a wide range of color—white, cream, yellow, salmon, pink, and red. Foliage is either bronze or green. Some varieties are tall—5 to 6 feet; others are dwarf—3 to 4 feet. In buying Cannas, get some of the newer and better varieties. May be used in groups in front of shrubs or as a screen for undesirable views.

Hymenocallis (Ismene) — SPIDERLILY (Peruvian Daffodil)

Natives of South America, having large leaves and 18- to 24-inch flower stalks bearing large white fragrant flowers resembling the Amaryllis. Plant out of doors in late May in small groups, 3 inches deep and 12 inches apart. Dig in fall after early frosts, and store in sawdust in a cool cellar. Use in perennial border or among annual flowers.

Oxalis — OXALIS

Dainty dwarf plants from various parts of the world used most frequently for house plants but sometimes as garden flowers. Plant out of doors in late May 1 to 2 inches deep and 4 to 6 inches apart. Dig in fall after frosts and store in paper bags as you would gladiolus. May be used in the rock garden, around pools, or on the shady side of the house.

Polygonum tuberosum — TUBEROSE

A fragrant summer flowering bulb from Mexico, once a great favorite but today seldom grown. Bulbs may be started indoors a month ahead or set out in the open, as Cannas. The 2-foot spikes of white flowers are produced in profusion from July to September. They prefer rich soil and plenty of moisture. Dig after frost and store in dry soil in cool cellar.

Tigridia pavonia — TIGERFLOWER

Relatively little grown bulbs from Mexico and Chile. The 2-foot stems bear large open flowers of yellow or orange with conspicuous spots during midsummer. Plant in clumps 3 inches deep and 6 inches apart in any good garden soil.

Zephyranthes — FAIRY LILY

Native of Mexico and the West Indies, used as garden flowers or house plants. The bulbs, if set out in April or early May, will bloom off and on during the summer. Plant 3 inches deep and 4 to 6 inches apart. Lift and store as you would Gladiolus after early frosts.

The grass-like leaves and pink flowers are from 10 to 15 inches in height. Use in perennial border, rock garden, between rose bushes, or among annuals.

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Additional bulletins are listed in The Ohio State University Agricultural Extension Bulletin 108, "Floriculture Bulletins and Books."

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